

Helicopter Dynamic Components Efforts at Fleet Readiness Center East

HCAT Meeting

New Orleans, LA

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| Report Documentation Page | | | | Form Approved OMB No. 0704-0188 | |
|--|------------------------------------|-------------------------------------|--|---|------------------------------------|
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| 1. REPORT DATE 24 JAN 2007 | | 2. REPORT TYPE | | 3. DATES COVERED 00-00-2007 to 00-00-2007 | |
| 4. TITLE AND SUBTITLE Helicopter Dynamic Components Efforts at Fleet Readiness Center East | | | | 5a. CONTRACT NUMBER | |
| | | | | 5b. GRANT NUMBER | |
| | | | | 5c. PROGRAM ELEMENT NUMBER | |
| 6. AUTHOR(S) | | | | 5d. PROJECT NUMBER | |
| | | | | 5e. TASK NUMBER | |
| | | | | 5f. WORK UNIT NUMBER | |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Air Depot Cherry Point,AIR 4.9.7.1,Cherry Point,NC,28533 | | | | 8. PERFORMING ORGANIZATION REPORT NUMBER | |
| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) | | | | 10. SPONSOR/MONITOR'S ACRONYM(S) | |
| | | | | 11. SPONSOR/MONITOR'S REPORT NUMBER(S) | |
| 12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited | | | | | |
| 13. SUPPLEMENTARY NOTES 27th Replacement of Hard Chrome and Cadmium Plating Program Review Meeting, January 23-25, 2007, New Orleans, LA. Sponsored by SERDP/ESTCP. | | | | | |
| 14. ABSTRACT | | | | | |
| 15. SUBJECT TERMS | | | | | |
| 16. SECURITY CLASSIFICATION OF: | | | 17. LIMITATION OF ABSTRACT Same as Report (SAR) | 18. NUMBER OF PAGES 20 | 19a. NAME OF RESPONSIBLE PERSON |
| a. REPORT unclassified | b. ABSTRACT unclassified | c. THIS PAGE unclassified | | | |

Current Work at Fleet Readiness Center East

- Funded to prototype repair components by Y0817 Environmental money
- Goals of the project
 - Prototype transmission components
 - Development of overhaul procedures for the components
 - Complete additional coupon testing
- Funding received and work initiated



Application of HVOF Coating

- Identifying available scrapped components
- Fixtures being developed
- Robotic programming underway
- Coating of three parts complete
- Developing draft process instructions
- Develop tech data sheets for each prototyped component



Finish Development

- Identifying diamond grinding wheels for finishing
- Discussions to be held with NAVAIR and Boeing on finish requirements
 - 12-20 Ra vs. <10Ra
- May not need to buy new grinding wheels for most components
- Possible training in the future
- Develop tech data sheets for each prototyped component



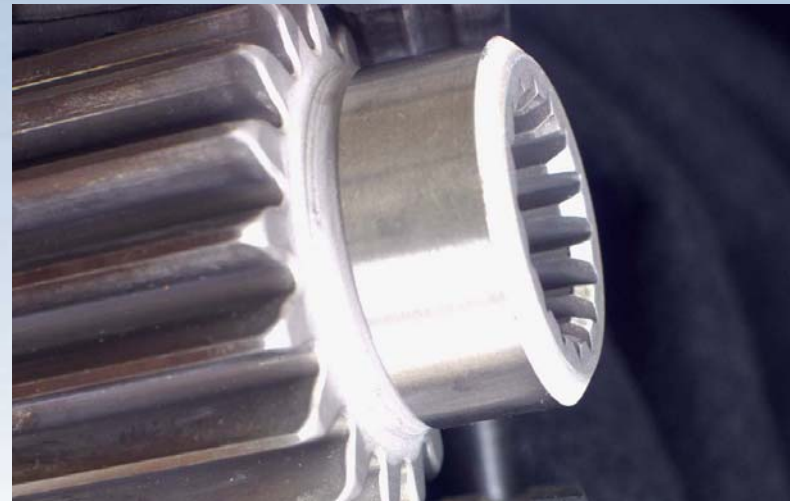
H-46 Components

- Input Gear
- Generator Gear
- Utility Pump Drive gear
- Aft input gear
- Aft sun gear
- Planet carrier
- Collector Gear



Generator Drive Gear

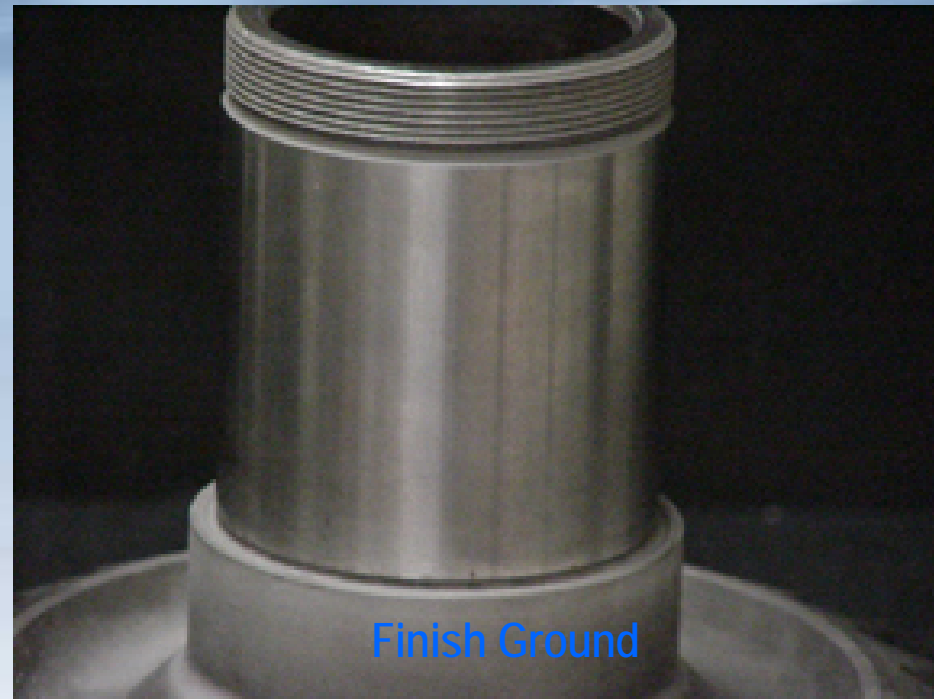
- CH-46 generator gears coated by Southwest Aeroservices
- Applied WC-Co
- Finished to 12-20 RA
- 150 hour endurance test
- No problems observed
- Prototype complete



H-46 Bevel Gear



As-Sprayed



Finish Ground

Spiral Bevel Pinion

P/N 423D2215-1



Aft Sun Gear

P/N 107D2256-7

- **Bearing Journals**
- **Wear damage**



Planet Carrier

P/N A02D2419-4

- **Bearing journal**
- **Wear damage**



Qualification Testing

- Provide RFI components for test
- Pre-test evaluation
 - Surface finishes verified
 - NDT of components
- 200 hour endurance test
- Post test evaluation
 - NDT of components
 - Measure surface finishes
 - Destructive evaluation of components as required



200 Hour Endurance Test

| Test | Test Condition | Runtime Hours | Torque in-lb #1 Side | Torque in-lb #2 Side | Engine Shaft RPM |
|------|----------------|---------------|-------------------------|-------------------------|------------------|
| 1 | 101.1% T.E. | 120 | 4586 | 4561 | 19,500 |
| 2 | 111..0% T.E. | 20 | 5037 | 5011 | 19,500 |
| 3 | 101.6% T.E. | 20 | 4627 | 4573 | 21,400 |
| 4 | 134.0% S.E. | 2 | 6065 | 0 | 21,400 |
| 5 | 134.8% S.E. | 2 | 0 | 6101 | 21,400 |
| 6 | 138.4% S.E. | 16 | 0 | 6263 | 19,500 |
| 7 | 134.7% S.E. | 16 | 6098 | 0 | 19,500 |
| 8 | 148.4% S.E. | 2 | 6716 | 0 | 19,500 |
| 9 | 148.6% S.E. | 2 | 0 | 6723 | 19,500 |



H-53 Implementation Efforts

- Damper System
 - Implementation underway
 - DCC-88
- Input gear
 - Evaluating HVOF WC-Co to replace plasma sprayed WC-Co



LECP 3939 DAMPER

LEAD-THE-FLEET

Problem:

- MRH Damper PN 70106-28000-048 is experiencing reduced damper Time-on-wing (T.O.W.)
- Current MTBR ~ 600 FH.

Cause:

- Premature dynamic seal failure
- Caused by destructive wear particles from the Beryllium Copper bushing

Corrective Action:

- LECP 3939 Damper configuration utilizes improved seal designs, new coatings in the housing and a stainless steel bushing coated in Katherm-87.
- Lead-the-Fleet Evaluation of LECP 3939 Dampers began FEB 2004.



LECP 3939 Main Rotor Dampers, Lead-The-Fleet

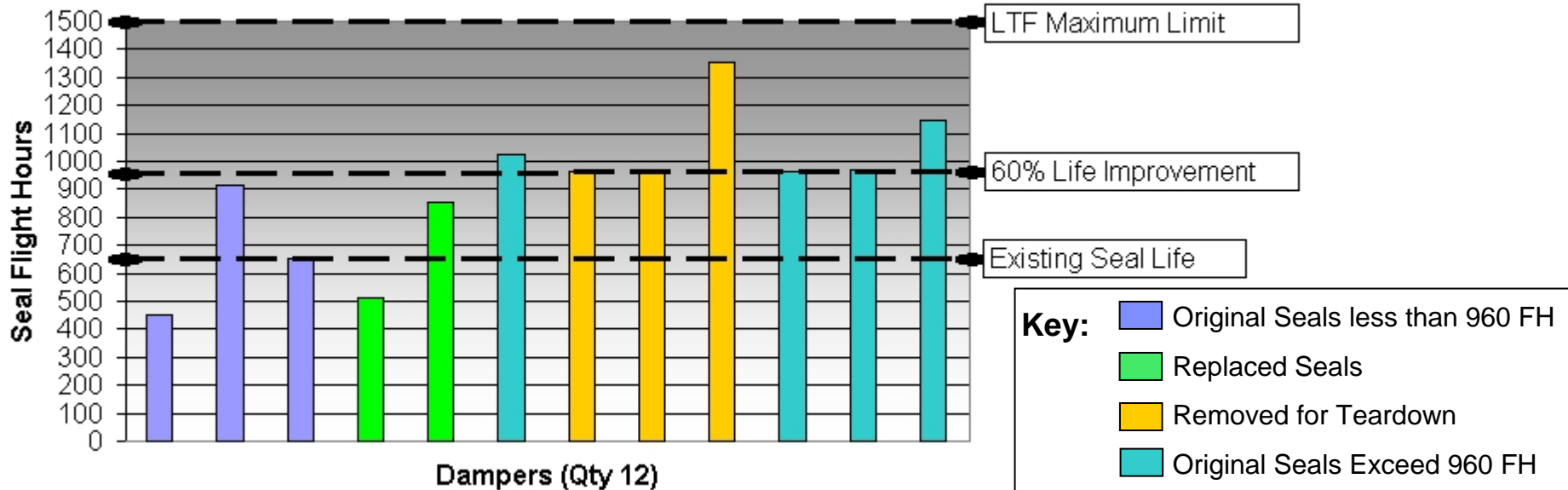
LTF Status:

- Highest Time Damper (1353.5 hours) removed during maintenance task for convenience. Not failed or leaking. Brought in for teardown at CP.
- Teardown in work, ECD Mid-Feb 2007.
- Remaining dampers will fly to 1500 flight hours or until they fail leakage limits, whichever occurs first.
- Milestones
 - Equivalence to existing -048 Damper: **ACCOMPLISHED**
 - 60% Seal Life Improvement Demonstration: **7 Units Exceed 960 FH to Date**
 - 108.3 Flight hours from accomplishing 60% Life Improvement Milestone.

SEAL FLIGHT HOURS

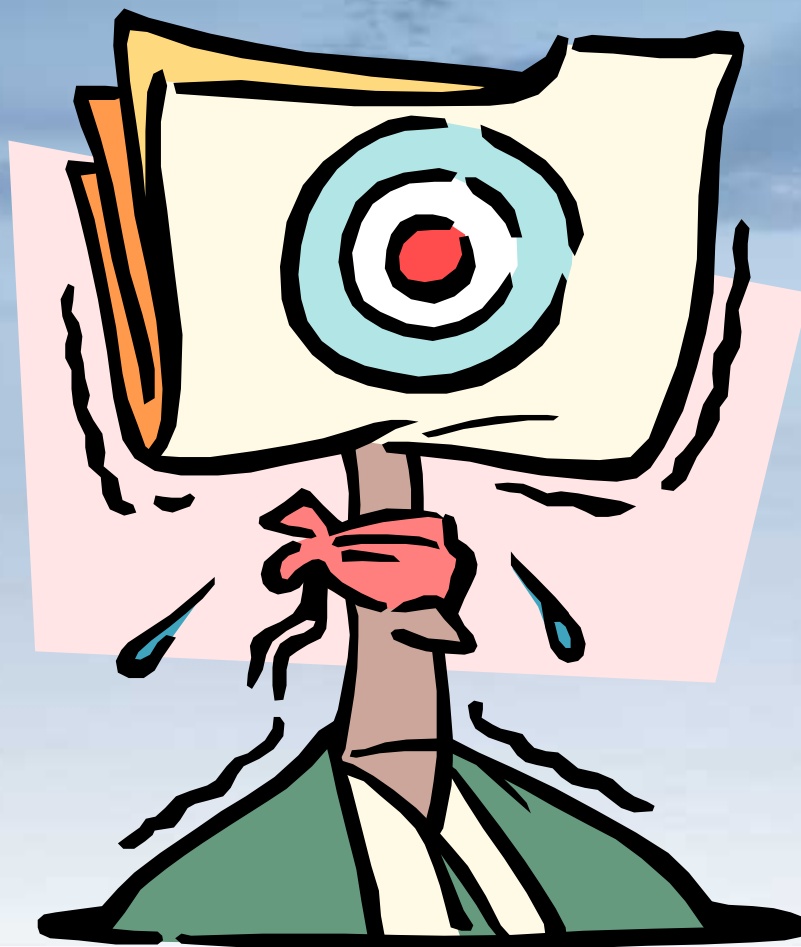
| Squadron | LECP3939 Serial Number | Flt Hrs Reported | Date Reported |
|---------------|------------------------|------------------|---------------|
| HSL-60 | A221-02572 | 452.3 | 1/23/07 |
| HSL-60 | A221-00637 | 915.4 | 1/23/07 |
| HSL-60 | A221-00150 | 651.4 | 1/23/07 |
| HSL-60 | A221-00100 | 513.8 | 1/23/07 |
| HSL-40 | A221-01009 | 851.7 | 12/31/06 |
| HSL 40 | A221-02164 | 1025.8 | 12/31/06 |
| Not Installed | A221-01201 | 965.4 | 4/20/06 |
| Not Installed | A221-00192 | 967 | 4/20/06 |
| Not Installed | A221-02218 | 1353.5 | 11/30/06 |
| HSL 41 | A221-02814 | 963.2 | 9/18/06 |
| HSL 41 | A221-00384 | 970.6 | 12/4/06 |
| HSL 40 | A221-00970 | 1148.4 | 12/31/06 |

LECP3939 STATUS

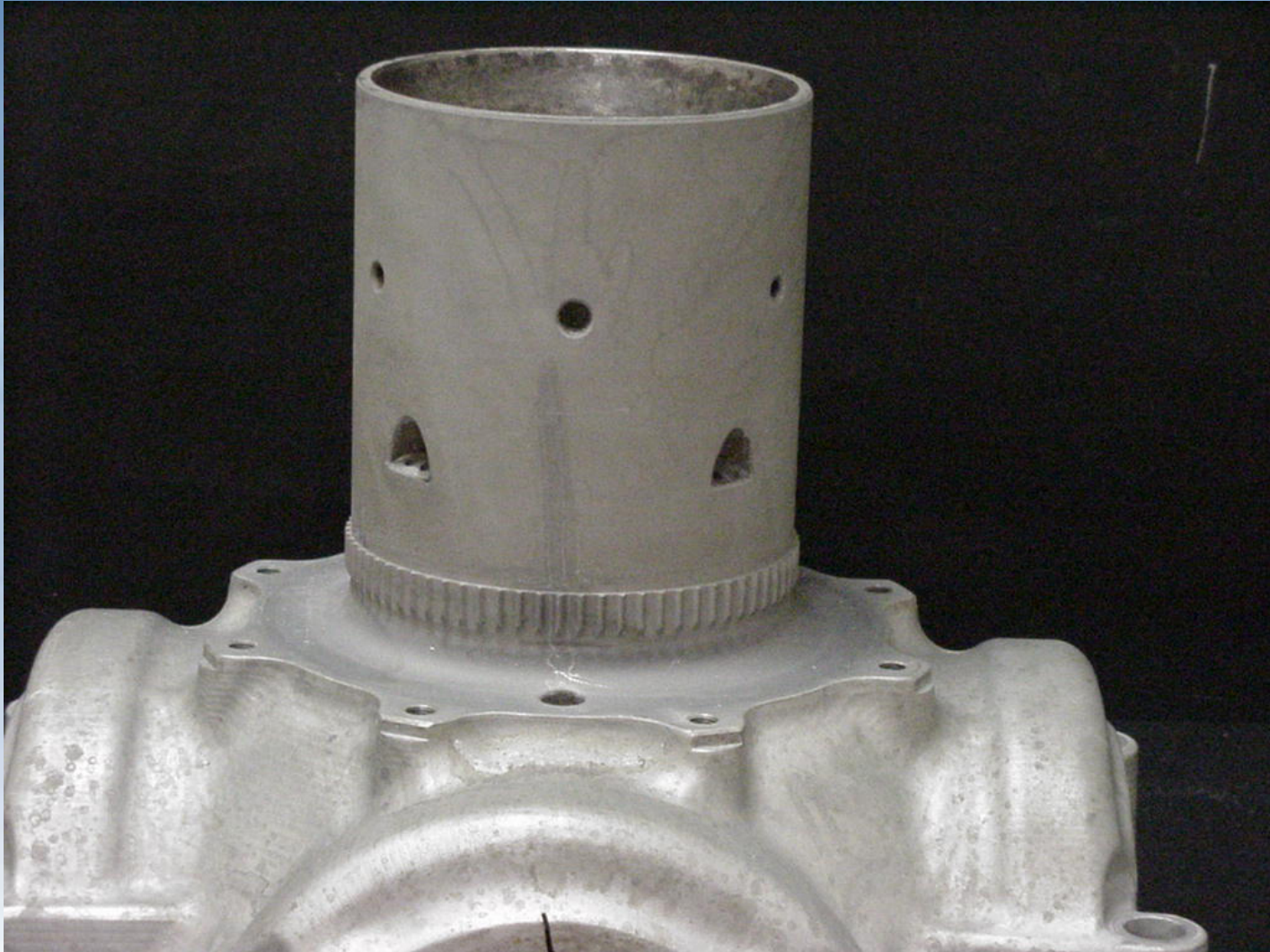


NAV  AIR

Questions?



P-3/C-130 Barrel & Pin Assembly

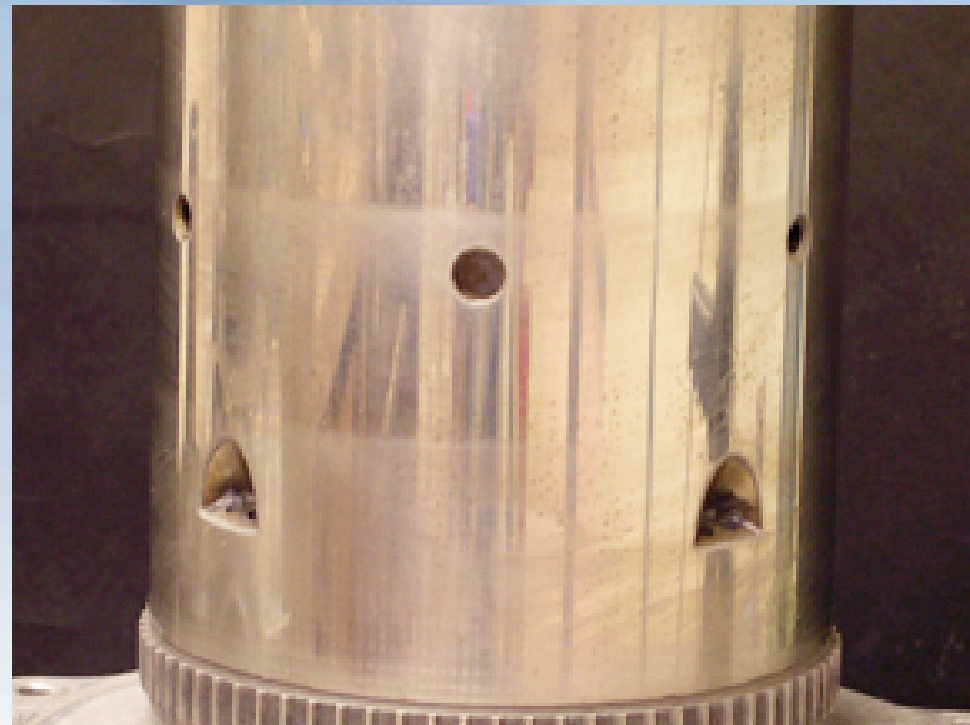


P-3/C-130 Barrel & Pin Assembly



As-Sprayed

Finish Ground



P-3/C-130 Lever Support Sleeve

